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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/512,087

04/07/2005

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02/22/2010

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EXAMINER

PARK, EDWARD

ART UNIT

PAPER NUMBER

2624

NOTIFICATION DATE

DELIVERY MODE

02/22/2010

ELECTRONIC

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ADVISORY ACTION ATTACHMENT TO PAPER NO. 20100203***Response to Arguments***

Applicant's arguments filed on 1/15/10, in regards to claims 59, 65, 71, have been fully considered but they are not persuasive. Applicant argues that Marchitto does not teach a shield which ... from reaches the detecting unit (see pg. 2, fourth paragraph – pg. 3, second paragraph). This argument is not considered persuasive since Marchitto teaches the limitation within fig. 5, col. 6, lines 10-61, where electromagnetic spectrum where tissue is highly absorbing, it is also highly scattering. Thus, a multiphoton effect can be used to gather absorption and scattering imaging information. For example, considering that blood absorbs strongly at about 400-425 nm, however radiant energy with this wavelength (which appears blue) is so strongly absorbed in tissue that it only penetrates superficially. However, it is possible with two-photon scattering and absorption to obtain information about blood using radiant energy at 800-850 nm. Such radiant energy is quite penetrating in tissue, and yet will interact with blood if the photon density per unit time is large enough. It is therefore possible to obtain imaging information (FIG. 5) using a pulsed laser producing near infrared radiant energy. For practical reasons, such an imaging scheme may benefit from using a Q-switched Nd:YAG laser (1064 nm), as such lasers are relatively inexpensive and fortuitously blood absorbs strongly at 532 nm. The 532 nm scattered information could be collected in synchrony with the pulsed Nd:YAG laser. On alternate scans, white light or infrared images could be captured. Comparison of the two could be used to determine the location of the blood (or other light

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absorbing/scattering chromophore) in the field of view. Examiner notes that it is clearly shown in fig. 5, and the corresponding text, where a pulse Nd:YAg laser and a 532 nm bandpass filter is utilized to obtain blood vessel information by filtering scattered absorption tissue information. The claim limitation calls for a shield to prevent near infra-red light scattered in a shall portion from reaching the detecting unit, and the cited text teaches this though the bandpass filter which allows a certain wavelength range where blood vessel information is captured while highly scattered surrounding tissue information is excluded.

Regarding claims 60-62, 64, 66-68, 70, 72, 73, the applicant argues that the dependent claims are allowable due to the same reasons as stated within claims 59, 65, 71 (see pg. 3, third paragraph). This argument is not considered persuasive since claims 59, 65, 71 stand rejected and the arguments can be seen above.

/Brian Q Le/

Primary Examiner, Art Unit 2624